Airline Reservation System

Introduction

The Airline Reservation System is designed to manage flights, customers, seats, and bookings efficiently. This project demonstrates a SQL-based backend implementation that automates seat allocation, handles cancellations, and provides reports on seat availability and booking summaries. The system ensures reliability, accuracy, and efficiency in airline operations.

Abstract

The Airline Reservation System was implemented using MySQL as the backend database. It features schema design for flights, customers, bookings, and seats with appropriate normalization and constraints. The project uses realistic datasets with more than 50 records for flights and bookings. Triggers were implemented to automate seat allocation and free seats on cancellations. Additionally, views were created to generate flight availability details and booking summary reports. This project highlights the importance of database constraints, normalization, and automation in managing real-world airline operations.

Tools Used

- MySQL: Backend relational database management system.
- MySQL Workbench: Used for database management and schema visualization.
- SQL: For schema creation, queries, triggers, and views.
- Python (ReportLab): For generating this project report in PDF format.

Steps Involved in Building the Project

1. Designed schema with normalized tables for Flights, Customers, Seats, and Bookings.
2. Inserted realistic sample data, including 20 flights, 25 customers, and 45+ bookings.
3. Generated seat layouts for each flight using a seat map template (32 seats per flight).
4. Developed triggers to automatically assign seats during booking and free them on cancellations.
5. Created views for flight availability and booking summaries for reporting purposes.
6. Tested scenarios such as overbooking, cancellations, and seat changes to ensure correctness.
7. Documented schema, queries, triggers, and reports for reference and scalability.

Conclusion

The Airline Reservation System successfully demonstrates the design and implementation of a SQL-based backend system for managing flights and bookings. By automating seat assignment and handling cancellations through triggers, the system ensures accuracy and operational efficiency. The project also proves scalability by simulating realistic flight and booking data. This system can serve as a foundation for advanced modules such as fare management, loyalty programs, and reporting dashboards. Overall, it provides practical exposure to SQL database design and automation in real-world airline management.